

General

Guideline Title

Stroke rehabilitation. Long-term rehabilitation after stroke.

Bibliographic Source(s)

National Clinical Guideline Centre. Stroke rehabilitation. Long-term rehabilitation after stroke. London (UK): National Institute for Health and Care Excellence (NICE); 2013 Jun. 45 p. (Clinical guideline; no. 162).

Guideline Status

This is the current release of the guideline.

Recommendations

Major Recommendations

Note from the National Guideline Clearinghouse (NGC): This guideline was developed by the National Clinical Guideline Centre (NCGC) on behalf of the National Institute for Health and Care Excellence (NICE). See the "Availability of Companion Documents" field for the full version of this guidance.

Note: The wording used in the recommendations in this guideline (for example, words such as 'offer' and 'consider') denotes the certainty with which the recommendation is made (the strength of the recommendations). See the end of the "Major Recommendations" field for further descriptions of the strength of recommendations.

Organising Health and Social Care for People Needing Rehabilitation after Stroke

Stroke Units

People with disability after stroke should receive rehabilitation in a dedicated stroke inpatient unit and subsequently from a specialist stroke team within the community.

An inpatient stroke rehabilitation service should consist of the following:

- A dedicated stroke rehabilitation environment
- A core multidisciplinary team (see "The Core Multidisciplinary Stroke Team," below) who have the knowledge, skills, and behaviours to work in partnership with people with stroke and their families and carers to manage the changes experienced as a result of a stroke
- Access to other services that may be needed, for example:
 - Continence advice

- Dietetics
- Electronic aids (for example, remote controls for doors, lights, and heating, and communication aids)
- Liaison psychiatry
- Orthoptics
- Orthotics
- Pharmacy
- Podiatry
- Wheelchair services
- A multidisciplinary education programme

The Core Multidisciplinary Stroke Team

A core multidisciplinary stroke rehabilitation team should comprise the following professionals with expertise in stroke rehabilitation:

- Consultant physicians
- Nurses
- Physiotherapists
- Occupational therapists
- Speech and language therapists
- Clinical psychologists
- Rehabilitation assistants
- Social workers

Throughout the care pathway, the roles and responsibilities of the core multidisciplinary stroke rehabilitation team should be clearly documented and communicated to the person and their family or carer.

Members of the core multidisciplinary stroke team should screen the person with stroke for a range of impairments and disabilities, in order to inform and direct further assessment and treatment.

Health and Social Care Interface

Health and social care professionals should work collaboratively to ensure a social care assessment is carried out promptly, where needed, before the person with stroke is transferred from hospital to the community. The assessment should:

- Identify any ongoing needs of the person and their family or carer, for example, access to benefits, care needs, housing, community participation, return to work, transport, and access to voluntary services
- Be documented and all needs recorded in the person's health and social care plan, with a copy provided to the person with stroke

Offer training in care (for example, in moving and handling and helping with dressing) to family members or carers who are willing and able to be involved in supporting the person after their stroke.

- Review family members' and carers' training and support needs regularly (as a minimum at the person's 6-month and annual reviews), acknowledging that these needs may change over time.

Transfer of Care from Hospital to Community

Offer early supported discharge to people with stroke who are able to transfer from bed to chair independently or with assistance, as long as a safe and secure environment can be provided.

Early supported discharge should be part of a skilled stroke rehabilitation service and should consist of the same intensity of therapy and range of multidisciplinary skills available in hospital. It should not result in a delay in delivery of care.

Hospitals should have systems in place to ensure that:

- People after stroke and their families and carers (as appropriate) are involved in planning for transfer of care, and carers receive training in care (for example, in moving and handling and helping with dressing).
- People after stroke and their families and carers feel adequately informed, prepared, and supported.
- General practitioners (GPs) and other appropriate people are informed before transfer of care.
- An agreed health and social care plan is in place, and the person knows whom to contact if difficulties arise.

- Appropriate equipment (including specialist seating and a wheelchair if needed) is in place at the person's residence, regardless of setting.

Before transfer from hospital to home or to a care setting, discuss and agree a health and social care plan with the person with stroke and their family or carer (as appropriate), and provide this to all relevant health and social care providers.

Before transfer of care from hospital to home for people with stroke:

- Establish that they have a safe and enabling home environment, for example, check that appropriate equipment and adaptations have been provided and that carers are supported to facilitate independence, and
- Undertake a home visit with them unless their abilities and needs can be identified in other ways, for example, by demonstrating independence in all self-care activities, including meal preparation, while in the rehabilitation unit

On transfer of care from hospital to the community, provide information to all relevant health and social care professionals and the person with stroke. This should include:

- A summary of rehabilitation progress and current goals
- Diagnosis and health status
- Functional abilities (including communication needs)
- Care needs, including washing, dressing, help with going to the toilet, and eating
- Psychological (cognitive and emotional) needs
- Medication needs (including the person's ability to manage their prescribed medications and any support they need to do so)
- Social circumstances, including carers' needs
- Mental capacity regarding the transfer decision
- Management of risk, including the needs of vulnerable adults
- Plans for follow-up, rehabilitation and access to health and social care and voluntary sector services

Ensure that people with stroke who are transferred from hospital to care homes receive assessment and treatment from stroke rehabilitation and social care services to the same standards as they would receive in their own homes.

Local health and social care providers should have standard operating procedures to ensure the safe transfer and long-term care of people after stroke, including those in care homes. This should include timely exchange of information between different providers using local protocols.

After transfer of care from hospital, people with disabilities after stroke (including people in care homes) should be followed up within 72 hours by the specialist stroke rehabilitation team for assessment of patient-identified needs and the development of shared management plans.

Provide advice on prescribed medications for people after stroke in line with recommendations in the NICE guideline [Medicines adherence](#). [Involving patients in decisions about prescribed medicines and supporting adherence](#) [] (NICE clinical guideline 76).

Planning and Delivering Stroke Rehabilitation

Screening and Assessment

On admission to hospital, to ensure the immediate safety and comfort of the person with stroke, screen them for the following and, if problems are identified, start management as soon as possible:

- Orientation
- Positioning, moving, and handling
- Swallowing
- Transfers (for example, from bed to chair)
- Pressure area risk
- Continence
- Communication, including the ability to understand and follow instructions and to convey needs and wishes
- Nutritional status and hydration (follow the recommendations in the NGC summary of the NICE guideline [Stroke. Diagnosis and initial management of acute stroke and transient ischaemic attack \[TIA\]](#) [NICE clinical guideline 68] and the NICE clinical guideline [Nutrition support in adults](#) [] [NICE clinical guideline 32]).

Perform a full medical assessment of the person with stroke, including cognition (attention, memory, spatial awareness, apraxia, perception), vision, hearing, tone, strength, sensation, and balance.

A comprehensive assessment of a person with stroke should take into account:

- Their previous functional abilities
- Impairment of psychological functioning (cognitive, emotional, and communication)
- Impairment of body functions, including pain
- Activity limitations and participation restrictions
- Environmental factors (social, physical, and cultural)

Information collected routinely from people with stroke using valid, reliable, and responsive tools should include the following on admission and discharge:

- National Institutes of Health Stroke Scale
- Barthel Index

Information collected from people with stroke using valid, reliable, and responsive tools should be fed back to the multidisciplinary team regularly.

Take into consideration the impact of the stroke on the person's family, friends, and/or carers and, if appropriate, identify sources of support.

Inform the family members and carers of people with stroke about their right to have a carer's needs assessment.

Setting Goals for Rehabilitation

Ensure that people with stroke have goals for their rehabilitation that:

- Are meaningful and relevant to them
- Focus on activity and participation
- Are challenging but achievable
- Include both short-term and long-term elements

Ensure that goal-setting meetings during stroke rehabilitation:

- Are timetabled into the working week
- Involve the person with stroke and, where appropriate, their family or carer in the discussion.

Ensure that during goal-setting meetings, people with stroke are provided with:

- An explanation of the goal-setting process
- The information they need in a format that is accessible to them
- The support they need to make decisions and take an active part in setting goals

Give people copies of their agreed goals for stroke rehabilitation after each goal-setting meeting.

Review people's goals at regular intervals during their stroke rehabilitation.

Planning Rehabilitation

Provide information and support to enable the person with stroke and their family or carer (as appropriate) to actively participate in the development of their stroke rehabilitation plan.

Stroke rehabilitation plans should be reviewed regularly by the multidisciplinary team. Time these reviews according to the stage of rehabilitation and the person's needs.

Documentation about the person's stroke rehabilitation should be individualised, and should include the following information as a minimum:

- Basic demographics, including contact details and next of kin
- Diagnosis and relevant medical information
- List of current medications, including allergies
- Standardised screening assessments (see "Screening and Assessment," above)
- The person's rehabilitation goals
- Multidisciplinary progress notes
- A key contact from the stroke rehabilitation team (including their contact details) to coordinate the person's health and social care needs

- Discharge planning information (including accommodation needs, aids, and adaptations)
- Joint health and social care plans, if developed
- Follow-up appointments

Intensity of Stroke Rehabilitation

Offer initially at least 45 minutes of each relevant stroke rehabilitation therapy for a minimum of 5 days per week to people who have the ability to participate, and where functional goals can be achieved. If more rehabilitation is needed at a later stage, tailor the intensity to the person's needs at that time. (Intensity of therapy for dysphagia, provided as part of speech and language therapy, is addressed under "Swallowing," below.)

Consider more than 45 minutes of each relevant stroke rehabilitation therapy 5 days per week for people who have the ability to participate and continue to make functional gains, and where functional goals can be achieved.

If people with stroke are unable to participate in 45 minutes of each rehabilitation therapy, ensure that therapy is still offered 5 days per week for a shorter time at an intensity that allows them to actively participate.

Providing Support and Information

Working with the person with stroke and their family or carer, identify their information needs and how to deliver them, taking into account specific impairments such as aphasia and cognitive impairments. Pace the information to the person's emotional adjustment.

Provide information about local resources (for example, leisure, housing, social services, and the voluntary sector) that can help to support the needs and priorities of the person with stroke and their family or carer.

Review information needs at the person's 6-month and annual stroke reviews and at the start and completion of any intervention period.

NICE has produced guidance on the components of good patient experience in adult National Health Service (NHS) services. Follow the recommendations in [Patient experience in adult NHS services](#) (NICE clinical guidance 138). (For recommendations on continuity of care and relationships see "Cognitive Functioning," below and for recommendations on enabling patients to actively participate in their care see "Emotional Functioning," below.)

Cognitive Functioning

Screen people after stroke for cognitive deficits. Where a cognitive deficit is identified, carry out a detailed assessment using valid, reliable, and responsive tools before designing a treatment programme.

Provide education and support for people with stroke and their families and carers to help them understand the extent and impact of cognitive deficits after stroke, recognising that these may vary over time and in different settings.

Visual Neglect

Assess the effect of visual neglect after stroke on functional tasks such as mobility, dressing, eating, and using a wheelchair, using standardised assessments and behavioural observation.

Use interventions for visual neglect after stroke that focus on the relevant functional tasks, taking into account the underlying impairment. For example:

- Interventions to help people scan to the neglected side, such as brightly coloured lines or highlighter on the edge of the page
- Alerting techniques such as auditory cues
- Repetitive task performance such as dressing
- Altering the perceptual input using prism glasses

Memory Function

Assess memory and other relevant domains of cognitive functioning (such as executive functions) in people after stroke, particularly where impairments in memory affect everyday activity.

Use interventions for memory and cognitive functions after stroke that focus on the relevant functional tasks, taking into account the underlying impairment. Interventions could include:

- Increasing awareness of the memory deficit

- Enhancing learning using errorless learning and elaborative techniques (making associations, use of mnemonics, internal strategies related to encoding information such as 'preview, question, read, state, test')
- External aids (for example, diaries, lists, calendars, and alarms)
- Environmental strategies (routines and environmental prompts)

Attention Function

Assess attention and cognitive functions in people after stroke using standardised assessments. Use behavioural observation to evaluate the impact of the impairment on functional tasks.

Consider attention training for people with attention deficits after stroke.

Use interventions for attention and cognitive functions after stroke that focus on the relevant functional tasks. For example, use generic techniques such as managing the environment and providing prompts relevant to the functional task.

Emotional Functioning

Assess emotional functioning in the context of cognitive difficulties in people after stroke. Any intervention chosen should take into consideration the type or complexity of the person's neuropsychological presentation and relevant personal history.

Support and educate people after stroke and their families and carers, in relation to emotional adjustment to stroke, recognising that psychological needs may change over time and in different settings.

When new or persisting emotional difficulties are identified at the person's 6-month or annual stroke reviews, refer them to appropriate services for detailed assessment and treatment.

Manage depression or anxiety in people after stroke who have no cognitive impairment in line with recommendations in the NICE guidelines [Depression in adults with a chronic physical health problem. Treatment and management](#) [] (NICE clinical guideline 91) and [Generalised anxiety disorder and panic disorder \(with or without agoraphobia\) in adults. Management in primary, secondary and community care](#) (NICE clinical guideline 113).

Vision

Screen people after stroke for visual difficulties.

Refer people with persisting double vision after stroke for formal orthoptic assessment.

Offer eye movement therapy to people who have persisting hemianopia after stroke and who are aware of the condition.

When advising people with visual problems after stroke about driving, consult the Driver and Vehicle Licensing Agency regulations.

Swallowing

Assess swallowing in people after stroke in line with recommendations in the NGC summary of the NICE guideline [Stroke. Diagnosis and initial management of acute stroke and transient ischaemic attack \(TIA\)](#) (NICE clinical guideline 68).

Offer swallowing therapy at least 3 times a week to people with dysphagia after stroke who are able to participate, for as long as they continue to make functional gains. Swallowing therapy could include compensatory strategies, exercises, and postural advice.

Ensure that effective mouth care is given to people with difficulty swallowing after stroke, in order to decrease the risk of aspiration pneumonia.

Healthcare professionals with relevant skills and training in the diagnosis, assessment, and management of swallowing disorders should regularly monitor and reassess people with dysphagia after stroke who are having modified food and liquid until they are stable (this recommendation is from [Nutrition support in adults](#) [] [NICE clinical guideline 32]).

Provide nutrition support to people with dysphagia in line with recommendations in [Nutrition support in adults](#) [] (NICE clinical guideline 32) and the NGC summary of the NICE guideline [Stroke. Diagnosis and initial management of acute stroke and transient ischaemic attack \(TIA\)](#) (NICE clinical guideline 68).

Communication

Screen people after stroke for communication difficulties within 72 hours of onset of stroke symptoms.

Each stroke rehabilitation service should devise a standardised protocol for screening for communication difficulties in people after stroke.

Refer people with suspected communication difficulties after stroke to a speech and language therapist for detailed analysis of speech and language impairments and assessment of their impact.

Provide appropriate information, education, and training to the multidisciplinary stroke team to enable them to support and communicate effectively with the person with communication difficulties and their family or carer.

Speech and language therapy for people with stroke should be led and supervised by a specialist speech and language therapist working collaboratively with other appropriately trained people – for example, speech and language therapy assistants, carers and friends, and members of the voluntary sector.

Provide opportunities for people with communication difficulties after stroke to have conversation and social enrichment with people who have the training, knowledge, skills, and behaviours to support communication. This should be in addition to the opportunities provided by families, carers, and friends.

Speech and language therapists should assess people with limited functional communication after stroke for their potential to benefit from using a communication aid or other technologies (for example, home-based computer therapies or smartphone applications).

Provide communication aids for those people after stroke who have the potential to benefit, and offer training in how to use them.

Tell the person with communication difficulties after stroke about community-based communication and support groups (such as those provided by the voluntary sector) and encourage them to participate.

Speech and language therapists should:

- Provide direct impairment-based therapy for communication impairments (for example, aphasia or dysarthria)
- Help the person with stroke to use and enhance their remaining language and communication abilities
- Teach other methods of communicating, such as gestures, writing, and using communication props
- Coach people around the person with stroke (including family members, carers, and health and social care staff) to develop supportive communication skills to maximise the person's communication potential
- Help the person with aphasia or dysarthria and their family or carer to adjust to a communication impairment
- Support the person with communication difficulties to rebuild their identity
- Support the person to access information that enables decision-making

When persisting communication difficulties are identified at the person's 6-month or annual stroke reviews, refer them back to a speech and language therapist for detailed assessment, and offer treatment if there is potential for functional improvement.

Help and enable people with communication difficulties after stroke to communicate their everyday needs and wishes, and support them to understand and participate in both everyday and major life decisions.

Ensure that environmental barriers to communication are minimised for people after stroke. For example, make sure signage is clear and background noise is minimised.

Make sure that all written information (including that relating to medical conditions and treatment) is adapted for people with aphasia after stroke. This should include, for example, appointment letters, rehabilitation timetables, and menus.

Offer training in communication skills (such as slowing down, not interrupting, using communication props, gestures, drawing) to the conversation partners of people with aphasia after stroke.

Movement

Provide physiotherapy for people who have weakness in their trunk or upper or lower limb, sensory disturbance or balance difficulties after stroke that have an effect on function.

People with movement difficulties after stroke should be treated by physiotherapists who have the relevant skills and training in the diagnosis, assessment, and management of movement in people with stroke.

Treatment for people with movement difficulties after stroke should continue until the person is able to maintain or progress function either independently or with assistance from others (for example, rehabilitation assistants, family members, carers, or fitness instructors).

Strength Training

Consider strength training for people with muscle weakness after stroke. This could include progressive strength building through increasing repetitions of body weight activities (for example, sit-to-stand repetitions), weights (for example, progressive resistance exercise), or resistance exercise on machines such as stationary cycles.

Fitness Training

Encourage people to participate in physical activity after stroke.

Assess people who are able to walk and are medically stable after their stroke for cardiorespiratory and resistance training appropriate to their individual goals.

Cardiorespiratory and resistance training for people with stroke should be started by a physiotherapist with the aim that the person continues the programme independently based on the physiotherapist's instructions (see the following recommendation).

For people with stroke who are continuing an exercise programme independently, physiotherapists should supply any necessary information about interventions and adaptations so that where the person is using an exercise provider, the provider can ensure their programme is safe and tailored to their needs and goals. This information may take the form of written instructions, telephone conversations, or a joint visit with the provider and the person with stroke, depending on the needs and abilities of the exercise provider and the person with stroke.

Tell people who are participating in fitness activities after stroke about common potential problems, such as shoulder pain, and advise them to seek advice from their general practitioner or therapist if these occur.

Hand and Arm Therapies – Orthoses for the Upper Limb

Do not routinely offer wrist and hand splints to people with upper limb weakness after stroke.

Consider wrist and hand splints in people at risk after stroke (for example, people who have immobile hands due to weakness, and people with high tone), to:

- Maintain joint range, soft tissue length, and alignment
- Increase soft tissue length and passive range of movement
- Facilitate function (for example, a hand splint to assist grip or function)
- Aid care or hygiene (for example, by enabling access to the palm)
- Increase comfort (for example, using a sheepskin palm protector to keep fingernails away from the palm of the hand)

Where wrist and hand splints are used in people after stroke, they should be assessed and fitted by appropriately trained healthcare professionals and a review plan should be established.

Teach the person with stroke and their family or carer how to put the splint on and take it off, care for the splint and monitor for signs of redness and skin breakdown. Provide a point of contact for the person if concerned.

Electrical Stimulation: Upper Limb

Do not routinely offer people with stroke electrical stimulation for their hand and arm.

Consider a trial of electrical stimulation in people who have evidence of muscle contraction after stroke but cannot move their arm against resistance.

If a trial of treatment is considered appropriate, ensure that electrical stimulation therapy is guided by a qualified rehabilitation professional.

The aim of electrical stimulation should be to improve strength while practising functional tasks in the context of a comprehensive stroke rehabilitation programme.

Continue electrical stimulation if progress towards clear functional goals has been demonstrated (for example, maintaining range of movement, or improving grasp and release).

Constraint-induced Movement Therapy

Consider constraint-induced movement therapy for people with stroke who have movement of 20 degrees of wrist extension and 10 degrees of finger extension. Be aware of potential adverse events (such as falls, low mood, and fatigue).

Shoulder Pain

Provide information for people with stroke and their families and carers on how to prevent pain or trauma to the shoulder if they are at risk of developing shoulder pain (for example, if they have upper limb weakness and spasticity).

Manage shoulder pain after stroke using appropriate positioning and other treatments according to each person's need.

For guidance on managing neuropathic pain follow the NGC summary of the NICE guideline [Neuropathic pain - pharmacological management](#). [The pharmacological management of neuropathic pain in adults in non-specialist settings](#) (NICE clinical guideline 96).

Repetitive Task Training

Offer people repetitive task training after stroke on a range of tasks for upper limb weakness (such as reaching, grasping, pointing, moving, and manipulating objects in functional tasks) and lower limb weakness (such as sit-to-stand transfers, walking, and using stairs).

Walking Therapies: Treadmill with or without Body Weight Support

Offer walking training to people after stroke who are able to walk, with or without assistance, to help them build endurance and move more quickly.

Consider treadmill training, with or without body weight support, as one option of walking training for people after stroke who are able to walk with or without assistance.

Electromechanical Gait Training

Offer electromechanical gait training to people after stroke only in the context of a research study.

Ankle-Foot Orthoses

Consider ankle-foot orthoses for people who have difficulty with swing-phase foot clearance after stroke (for example, tripping, and falling) and/or stance-phase control (for example, knee and ankle collapse or knee hyper-extensions) that affects walking.

Assess the ability of the person with stroke to put on the ankle-foot orthosis or ensure they have the support needed to do so.

Assess the effectiveness of the ankle-foot orthosis for the person with stroke, in terms of comfort, speed, and ease of walking.

Assessment for and treatment with ankle-foot orthoses should only be carried out as part of a stroke rehabilitation programme and performed by qualified professionals.

Electrical Stimulation: Lower Limb

For guidance on functional electrical stimulation for the lower limb see [Functional electrical stimulation for drop foot of central neurological origin](#) (NICE interventional procedure guidance 278).

Self-care

Provide occupational therapy for people after stroke who are likely to benefit, to address difficulties with personal activities of daily living. Therapy may consist of restorative or compensatory strategies.

- Restorative strategies may include:
 - Encouraging people with neglect to attend to the neglected side
 - Encouraging people with arm weakness to incorporate both arms
 - Establishing a dressing routine for people with difficulties such as poor concentration, neglect, or dyspraxia which make dressing problematic
- Compensatory strategies may include:
 - Teaching people to dress one-handed
 - Teaching people to use devices such as bathing and dressing aids

People who have difficulties in activities of daily living after stroke should have regular monitoring and treatment by occupational therapists with core skills and training in the analysis and management of activities of daily living. Treatment should continue until the person is stable or able to progress independently.

Assess people after stroke for their equipment needs and whether their family or carers need training to use the equipment. This assessment should be carried out by an appropriately qualified professional. Equipment may include hoists, chair raisers, and small aids such as long-handled sponges.

Ensure that appropriate equipment is provided and available for use by people after stroke when they are transferred from hospital, whatever the setting (including care homes).

Return to Work

Return-to-work issues should be identified as soon as possible after the person's stroke, reviewed regularly, and managed actively. Active management should include:

- Identifying the physical, cognitive, communication, and psychological demands of the job (for example, multi-tasking by answering emails and telephone calls in a busy office)
- Identifying any impairments on work performance (for example, physical limitations, anxiety, fatigue preventing attendance for a full day at work, cognitive impairments preventing multi-tasking, and communication deficits)
- Tailoring an intervention (for example, teaching strategies to support multi-tasking or memory difficulties, teaching the use of voice-activated software for people with difficulty typing, and delivery of work simulations)
- Educating about the Equality Act 2010 and support available (for example, an access to work scheme)
- Workplace visits and liaison with employers to establish reasonable accommodations, such as provision of equipment and graded return to work

Manage return to work or long-term absence from work for people after stroke in line with recommendations in [Managing long-term sickness and incapacity for work](#) [] (NICE public health guidance 19).

Long-term Health and Social Support

Inform people after stroke that they can self-refer, usually with the support of a general practitioner or named contact, if they need further stroke rehabilitation services.

Provide information so that people after stroke are able to recognise the development of complications of stroke, including frequent falls, spasticity, shoulder pain, and incontinence.

Encourage people to focus on life after stroke and help them to achieve their goals. This may include:

- Facilitating their participation in community activities, such as shopping, civic engagement, sports and leisure pursuits, visiting their place of worship, and stroke support groups
- Supporting their social roles, for example, work, education, volunteering, leisure, family, and sexual relationships
- Providing information about transport and driving (including Driver and Vehicle Licensing Agency requirements; see <https://www.gov.uk/government/organisations/driver-and-vehicle-licensing-agency> []).

Manage incontinence after stroke in line with recommendations in the NGC summary of the NICE guideline [Urinary incontinence in neurological disease. Management of lower urinary tract dysfunction in neurological disease](#) (NICE clinical guideline 148) and the NICE guideline [Faecal incontinence: the management of faecal incontinence in adults](#) [] (NICE clinical guideline 49).

Review the health and social care needs of people after stroke and the needs of their carers at 6 months and annually thereafter. These reviews should cover participation and community roles to ensure that people's goals are addressed.

For guidance on secondary prevention of stroke, follow recommendations in the NICE guidelines [Lipid modification. Cardiovascular risk assessment and the modification of blood lipids for the primary and secondary prevention of cardiovascular disease](#) [] (NICE clinical guideline 67), [Hypertension. Clinical management of primary hypertension in adults](#) (NICE clinical guideline 127), and [Type 2 diabetes. The management of type 2 diabetes](#) [] (NICE clinical guideline 87) and the NICE guideline [Atrial fibrillation. The management of atrial fibrillation](#) [] (NICE clinical guideline 36).

Provide advice on prescribed medications in line with recommendations in the NICE guideline [Medicines adherence. Involving patients in decisions about prescribed medicines and supporting adherence](#) [] (NICE clinical guideline 76).

Definitions:

Strength of Recommendations

Some recommendations can be made with more certainty than others. The Guideline Development Group (GDG) makes a recommendation based on the trade-off between the benefits and harms of an intervention, taking into account the quality of the underpinning evidence. For some interventions, the GDG is confident that, given the information it has looked at, most patients would choose the intervention. The wording used in the recommendations in this guideline denotes the certainty with which the recommendation is made (the strength of the recommendation).

Interventions That Must (or Must Not) Be Used

The GDG usually uses 'must' or 'must not' only if there is a legal duty to apply the recommendation. Occasionally 'must' (or 'must not') is used if the consequences of not following the recommendation could be extremely serious or potentially life threatening.

Interventions That Should (or Should Not) Be Used – a 'Strong' Recommendation

The GDG uses 'offer' (and similar words such as 'refer' or 'advise') when confident that, for the vast majority of patients, an intervention will do more good than harm, and be cost effective. Similar forms of words (for example, 'Do not offer...') are used when the GDG is confident that an intervention will not be of benefit for most patients.

Interventions That Could Be Used

The GDG uses 'consider' when confident that an intervention will do more good than harm for most patients, and be cost effective, but other options may be similarly cost effective. The choice of intervention, and whether or not to have the intervention at all, is more likely to depend on the patient's values and preferences than for a strong recommendation, and so the healthcare professional should spend more time considering and discussing the options with the patient.

Clinical Algorithm(s)

A NICE pathway titled "Stroke Overview" is available at the [National Institute for Health and Care Excellence Web site](#) .

Scope

Disease/Condition(s)

Stroke with continuing impairment, activity limitation, or participation restriction

Note: The guideline did not consider primary or secondary prevention of stroke, acute stroke or assessment for rehabilitation.

Guideline Category

Counseling

Evaluation

Management

Rehabilitation

Screening

Treatment

Clinical Specialty

Family Practice

Neurology

Nutrition

Ophthalmology
Orthopedic Surgery
Otolaryngology
Physical Medicine and Rehabilitation
Podiatry
Psychiatry
Psychology
Speech-Language Pathology

Intended Users

Advanced Practice Nurses
Allied Health Personnel
Dietitians
Health Care Providers
Hospitals
Nurses
Occupational Therapists
Patients
Physical Therapists
Physician Assistants
Physicians
Podiatrists
Psychologists/Non-physician Behavioral Health Clinicians
Public Health Departments
Social Workers
Speech-Language Pathologists

Guideline Objective(s)

- To provide evidence-based advice on the care of adults and young people aged 16 years and older who have had a stroke with continuing impairment, activity limitation or participation restriction
- To provide a joint clinical and social care guideline on the long-term rehabilitation and support of stroke patients

Target Population

Adults and young people 16 years and older who have had a stroke with continuing impairment, activity limitation, or participation restriction

Note: This guideline does not include the following populations:

Infants and children under 16 years
People who have had a transient ischaemic attack

Interventions and Practices Considered

1. Providing rehabilitation in a dedicated stroke inpatient unit and subsequently from a specialist stroke team within the community
2. Use of a core multidisciplinary stroke rehabilitation team
3. Collaboration between health and social care professionals
4. Training of family/carers
5. Early supported discharge from hospital to community
6. Comprehensive screening and assessment of people with stroke before commencing rehabilitation
7. Setting goals for rehabilitation
8. Planning rehabilitation
9. Intensity of rehabilitation
10. Providing information and support to people with stroke and their families and carers
11. Assessment of cognitive function, including visual neglect, memory function, and attention function, and providing information, support, and interventions
12. Assessment and management of emotional functioning
13. Screening for visual difficulties and referring for orthoptic assessment, offering eye movement therapy, and advice on driving, as appropriate
14. Assessment of swallowing difficulties and offering swallowing therapy and nutrition support, as needed
15. Screening for communication difficulties and referral to speech and language therapy
16. Physiotherapy including strength and fitness training, hand and arm therapy, electrical stimulation, constraint-induced movement therapy, management of shoulder pain, repetitive task training, walking therapy, electromechanical gait therapy, and ankle-foot orthoses
17. Occupational therapy for self-care
18. Management of return to work
19. Long-term health and social support

Major Outcomes Considered

- Measures of activities of daily living
- Physical function
- Cognitive function
- Emotional function
- Communication skills
- Optimised strategies to minimise impairment and maximise activity/participation
- Death
- Dependency
- Institutional care
- Duration of stay in hospital or institution or both
- Impact of intervention on mood/depression
- Patient and carer satisfaction
- Health-related quality of life
- Quality adjusted life-years (QALY)

Methodology

Methods Used to Collect/Select the Evidence

Hand-searches of Published Literature (Primary Sources)

Hand-searches of Published Literature (Secondary Sources)

Description of Methods Used to Collect/Select the Evidence

Note from the National Guideline Clearinghouse (NGC): This guideline was developed by the National Clinical Guideline Centre (NCGC) on behalf of the National Institute for Health and Care Excellence (NICE). See the "Availability of Companion Documents" field for the full version of this guidance.

Developing the Review Questions and Outcomes

Review questions were developed in a PICO framework (patient, intervention, comparison, and outcome) for intervention reviews. This was to guide the literature searching process, appraisal, and synthesis of evidence and to facilitate the development of recommendations by the Guideline Development Group (GDG). They were drafted by the NCGC technical team and refined and validated by the GDG. The questions were based on the key clinical areas identified in the scope (see Appendix A of the full version of the original guideline document). A total of 22 review questions were identified. Full literature searches, critical appraisals, and evidence reviews were completed for all the specified clinical questions.

During the development of questions concerning employment and return to work, provision of information, delivery of psychological therapies, and early supported discharge, the GDG took the following issues into consideration:

- When the GDG formulated the question about aids to return to work, they acknowledged the universal consensus in the literature about the predictive factors restricting people after stroke to return to work. For this reason, they believed that the review of observational or cohort studies investigating this issue would not provide any added value in the formulation of recommendations for this guideline. The GDG believed that randomised trials investigating the impact of any type of intervention that could facilitate people to return to employment (either former or new employment) was a higher priority for the purposes of this guideline. In addition, the GDG noted that the nature of vocational interventions would be very diverse and tailored to individual circumstances (type of disability, nature of employment).
- During the formulation of a question related to provision of information for people after stroke and their carers, the GDG had a full discussion with regard to the large and heterogeneous area of information provision. The systematic reviewers were clearly unable to address all information aspects within the timeline available. The GDG agreed that people after stroke live in a rich information environment, although it is not always tailored to the patient's needs. The GDG felt it was particularly important to look at the evidence pertaining to the provision of 'supported' information (information given with additional support of some kind such as the active provision of information, the encouragement of feedback, availability of peer support, or use of interactive computer programme as opposed to the provision of leaflets/booklets in isolation) in order to investigate its impact on mood and depression in people after stroke and potentially direct the development of recommendations in this area.
- For the psychological support question, the GDG thought that this should investigate the effectiveness of the psychological therapies such as family therapy, cognitive-behaviour therapy, and relationship counselling provided to the family (including the person with stroke) on the quality of life of people with stroke and their carers. The group acknowledged that it was not usual to have a psychological therapy in isolation and therefore all of these therapies may also include some form of education in combination. In light of the publication of the 'Patient experience in adult NHS services' (NICE clinical guideline 138) the GDG agreed that this guidance could be cross-referenced where appropriate.
- When formulating the question on early supported discharge, the GDG agreed to investigate the effectiveness of early supported discharge on improving specific patient and hospital related outcomes (such as mortality, quality of life, readmissions, and length of stay in the hospital). The GDG did not consider that patients would have any different information needs after early supported discharge to other patients being discharged from hospital.

During the development of questions for this guideline scoping searches for cohort studies were undertaken and the NCGC technical team consulted with the GDG on whether they were aware of any large cohort studies in these areas that would justify including studies other than randomised trials. None were identified.

Searching for Evidence

Clinical Literature Search

The aim of the literature review was to identify all available, relevant published evidence in relation to the key clinical questions generated by the GDG. Systematic literature searches were undertaken to identify evidence within published literature in order to answer the review questions as per The Guidelines Manual (2009) (see the "Availability of Companion Documents" field). Clinical databases were searched using relevant medical subject headings, free-text terms and study type filters where appropriate. Studies published in languages other than English were not reviewed.

Where possible, searches were restricted to articles published in the English language. All searches were conducted on core databases, MEDLINE, EMBASE, the CINAHL, and The Cochrane Library. Additional subject specific databases were used for some questions: PsycINFO for patient views, all searches were updated on 5th October 2012. No papers after this date were considered.

Search strategies were checked by looking at reference lists of relevant key papers, checking search strategies in other systematic reviews and asking the GDG for known studies in a specific area. The questions, the study types applied, the databases searched, and the years covered can be found in Appendix D of the full version of the original guideline document.

During the scoping stage, a search was conducted for guidelines and reports on the websites listed below and on organisations relevant to the topic. Searching for grey literature or unpublished literature was not undertaken. All references sent by stakeholders were considered.

- Guidelines International Network database (www.gin.net)
- National Guideline Clearinghouse (www.guideline.gov/)
- National Institute for Health and Care Excellence (NICE) (www.nice.org.uk)
- National Institutes of Health Consensus Development Program (consensus.nih.gov/)
- Health Information Resources, NHS Evidence (www.library.nhs.uk/)

The titles and abstracts of records retrieved by the searches were scanned for relevance to the GDG's clinical questions. Any potentially relevant publications were obtained in full text. These were assessed against the inclusion criteria and the reference lists were scanned for any articles not previously identified. Further references were also suggested by the GDG.

Health Economic Literature Search

Systematic literature searches were also undertaken to identify health economic evidence within published literature relevant to the review questions. The evidence was identified by conducting a broad search relating to the guideline population in the National Health Service Economic Evaluation Database (NHS EED), the Health Economic Evaluations Database (HEED) and Health Technology Assessment (HTA) databases with no date restrictions. Additionally, the search was run on MEDLINE and EMBASE, with a specific economic filter, to ensure recent publications that had not yet been indexed by these databases were identified. Studies published in languages other than English were not reviewed. Where possible, searches were restricted to articles published in English language. The search strategies for health economics are included in Appendix D of the full version of the original guideline document. All searches were updated on 5th Oct 2012. No papers published after this date were considered.

Evidence of Effectiveness

The research fellow:

- Identified potentially relevant studies for each review question from the relevant search results by reviewing titles and abstracts. Twenty per cent of the sift and selection of papers was quality assured by a second reviewer to eliminate any potential of selection bias or error. Full papers were then obtained.
- Reviewed full papers against pre-specified inclusion/exclusion criteria to identify studies that addressed the review question in the appropriate population and reported on outcomes of interest (review protocols are included in Appendix D of the original guideline document).

Inclusion/Exclusion Criteria

The inclusion/exclusion of studies was based on the review protocols (see Appendix D of the full version of the original guideline document). The GDG were consulted about any uncertainty regarding inclusion/exclusion of selected studies. Minimum sample size and the proportion of participants with stroke were among the inclusion/exclusion criteria used for the selection of studies in the evidence reviews. The GDG agreed that (with the exception of review questions on cognitive functions and Functional Electrical Stimulation) the sample size of 20 participants (10 in each arm) would be the minimum requirement for a study to be included. For the review questions on cognitive functions, the minimum sample size would be set at 10 participants in total due to the nature of interventions and the availability of studies in the literature. This decision on studies' sample size cut off points was made for pragmatic reasons.

Any study on stroke population at least 2 weeks post stroke were included. Any restrictions on selection of studies with populations on long term rehabilitation were not applied.

Due to the nature of interventions investigated in the evidence reviews, memory strategies, eye movement therapy, swallowing, constraint induced movement therapy, treadmill, electromechanical gait training, ankle-foot, aids to return to work, which aimed ultimately to reduce disability and would be applicable to other populations (who have not experienced stroke), the GDG decided to allow use of mixed populations for reviewing

these questions, as long as the minimum proportion of participants with stroke in these studies was set at 50%. See the review protocols in Appendix E of the full version of the original guideline document and excluded studies by the review questions (with their exclusion reasons) in Appendix M of the full version of the original guideline document for full details.

Type of Studies

Systematic reviews, double blinded, single blinded, and unblinded parallel randomised controlled trials (RCTs) and cross over randomized studies were included in the evidence reviews for this guideline.

Randomised trials were included, as they are considered the most robust type of study design that could produce an unbiased estimate of the intervention effects. The GDG believed that the reason why no large trials were found for this population was largely because stroke units are relatively new and prior to their formation it has not been possible to conduct large multi-centre RCTs.

The NCGC technical team also searched for systematic reviews of cohort studies, however none was found in any review question. The GDG decided not to include individual cohort studies. Cohort studies have been based in rehabilitation units where there are mixed population groups and extracting stroke data from those mixed populations would be challenging. Preliminary searches undertaken did not find any large cohort studies; therefore the GDG agreed that individual cohort studies would not provide any added value to the reviews of individual interventions.

Evidence of Cost-Effectiveness

Literature Review

The health economist:

- Identified potentially relevant studies for each review question from the economic search results by reviewing titles and abstracts – full papers were then obtained
- Reviewed full papers against pre-specified inclusion/exclusion criteria to identify relevant studies

Inclusion/Exclusion

Full economic evaluations (studies comparing costs and health consequences of alternative courses of action: cost–utility, cost–effectiveness, cost–benefit, and cost–consequence analyses) and comparative costing studies that addressed the review question in the relevant population were considered potentially applicable as economic evidence.

Studies that only reported cost per hospital (not per patient), or only reported average cost effectiveness, without disaggregated costs and effects, were excluded. Abstracts, posters, reviews, letters/editorials, foreign language publications, and unpublished studies were excluded. Studies judged to have an applicability rating of 'not applicable' were excluded (this included studies that took the perspective of a non-OECD Organisation for Economic Co-operation and Development [OECD] country).

Remaining studies were prioritised for inclusion based on their relative applicability to the development of this guideline and the study limitations. For example, if a high quality, directly applicable UK analysis was available other less relevant studies may not have been included. Where exclusions occurred on this basis, this is noted in the relevant section.

For more details about the assessment of applicability and methodological quality see the economic evaluation checklist (the Guidelines Manual, Appendix H [see the "Availability of Companion documents" field]) and the health economics research protocol in Appendix E of the full version of the original guideline document.

Post Consultation Protocol Including Modified Delphi Methodology

In consultation with NICE and the GDG the NCGC technical team conducted additional work to address the areas identified by stakeholders and not covered in the original scope. Comprehensive searches of databases with terms designed to identify evidence related to the topics identified by stakeholders were undertaken following the NICE process but restricted to retrieve other guidelines and systematic reviews only. In addition a similar scoping search was done for economic evidence relating to the same areas. The search strategy was limited to capture only economic evaluations. A first sift was undertaken to identify potentially relevant economic papers related to the topics.

Number of Source Documents

The number of studies identified for each clinical question is provided in Appendix G of the full version of the original guideline document (see the "Availability of Companion Documents" field).

Methods Used to Assess the Quality and Strength of the Evidence

Weighting According to a Rating Scheme (Scheme Given)

Rating Scheme for the Strength of the Evidence

Overall Quality of Outcome Evidence in Grading of Recommendations Assessment, Development and Evaluation (GRADE)

Level	Description
High	Further research is very unlikely to change confidence in the estimate of effect.
Moderate	Further research is likely to have an important impact on confidence in the estimate of effect and may change the estimate.
Low	Further research is very likely to have an important impact on confidence in the estimate of effect and is likely to change the estimate.
Very Low	Any estimate of effect is very uncertain.

Methods Used to Analyze the Evidence

Meta-Analysis

Review of Published Meta-Analyses

Systematic Review with Evidence Tables

Description of the Methods Used to Analyze the Evidence

Note from the National Guideline Clearinghouse (NGC): This guideline was developed by the National Clinical Guideline Centre (NCGC) on behalf of the National Institute for Health and Care Excellence (NICE). See the "Availability of Companion Documents" field for the full version of this guidance.

Evidence of Effectiveness

The research fellow:

- Critically appraised relevant studies using the appropriate checklist as specified in the Guidelines Manual (see the "Availability of Companion Documents" field).
- Extracted key information about the study's methods and results into evidence tables (evidence tables are included in Appendix H of the full version of the original guideline document).
- Generated summaries of the evidence by outcome (included in the relevant chapter write-ups):
 - Randomised studies: meta-analysed, where appropriate, and reported in Grading of Recommendations Assessment, Development and Evaluation (GRADE) profiles (for clinical studies).

Methods of Combining Clinical Studies

Data Synthesis for Intervention Reviews

Where possible, meta-analyses were conducted to combine the results of studies for each review question using Cochrane Review Manager (RevMan5) software. Fixed-effects (Mantel-Haenszel) techniques were used to calculate risk ratios (relative risk) for the binary outcomes. The outcome(s) was (were) analysed using an inverse variance method for pooling weighted mean differences and where the studies had different scales, standardised mean differences were used.

Statistical heterogeneity was assessed by considering the chi-squared test for significance at $p < 0.1$ or an I-squared inconsistency statistic of $> 50\%$ to indicate significant heterogeneity. Where significant heterogeneity was present, the NCGC technical team carried out a sensitivity analysis

with particular attention paid to allocation concealment, blinding, and loss to follow-up (missing data). In cases where there was inadequate allocation concealment, unclear blinding or differential missing data more than 20% in the two groups, this was examined in a sensitivity analysis. For the latter, the duration of follow-up was also taken into consideration prior to including in a sensitivity analysis. No subgroup analyses were predefined with the exception of the clinical question for constraint induced therapy for which a subgroup analysis on duration of intervention (more or less than 5 hours) was pre-specified (see Appendix E of the full version of the original guideline document for further details).

If no sensitivity analysis was found to completely resolve statistical heterogeneity then a random effects (DerSimonian and Laird) model was employed to provide a more conservative estimate of the effect.

For continuous outcomes, the means and standard deviations were required for meta-analysis. However, in cases where standard deviations were not reported, the standard error was calculated if the p-values or 95% confidence intervals were reported and meta-analysis was undertaken with the mean and standard error using the generic inverse variance method in Cochrane Review Manager (RevMan5) software. When the only evidence was based on studies that summarised results by only presenting medians (and interquartile range) or only p values, this information was included in the GRADE tables without calculating the relative and absolute effect. Consequently, imprecision of effect could not be assessed when results were not presented in the studies by means and standard deviations.

For binary outcomes, absolute event rates were also calculated using the GRADEpro software using event rate in the control arm of the pooled results.

The results from cross over studies were combined in a meta-analysis with those from parallel randomised trials, only after corrections have been made to the standard error for the crossover trials.

Type of Studies

For most of the reviews the content of interventions and the referred populations within the included studies was found to be very diverse, making the extraction of relevant data challenging and time consuming. In addition, the Guideline Development Group (GDG) had difficulties in drawing overall conclusions on the body of evidence presented and it was often not possible to make recommendations specifying what interventions should comprise of. In these instances, the GDG decided that the results of each outcome should be presented separately for each study and a meta-analysis could not be conducted. Due to the diversity of interventions, it was decided to include a summary table of studies included with individual characteristics (population, intervention, control, outcomes) at the beginning of each evidence review.

Type of Analysis

Estimates of effect from individual studies were based on Intention To Treat (ITT) analysis with the exception of the outcome of experience of adverse events whereas the NCGC technical team used Available Case Analysis. ITT analysis is where all participants included in the randomisation process were considered in the final analysis based on the intervention and control groups to which they were originally assigned. The NCGC technical team assumed that participants in the trials lost to follow-up did not experience the outcome of interest (for categorical outcomes) and they would not considerably change the average scores of their assigned groups (for continuous outcomes).

It is important to note that ITT analyses tend to bias the results towards no difference. ITT analysis is a conservative approach to analyse the data, and therefore the effect may be smaller than in reality.

However, the majority of outcomes selected to be reviewed were continuous outcomes, very few people dropped out and most of the studies reported data on an ITT basis.

Appraising the Quality of Evidence by Outcomes

The evidence for outcomes from the included randomised controlled trials was evaluated and presented using an adaptation of the 'GRADE toolbox' developed by the international GRADE working group (<http://www.gradeworkinggroup.org/>). The software (GRADEpro) developed by the GRADE working group was used to assess the quality of each outcome, taking into account individual study quality and the meta-analysis results. The summary of studies characteristics and findings was presented in one table in the full version of the original guideline document. The 'Clinical/Economic Study Characteristics' table includes details of the quality assessment while the "Clinical/Economic Summary of Findings" table includes pooled outcome data and where appropriate, an absolute measure of intervention effect and the summary of quality of evidence for that outcome. In this table, the columns for intervention and control indicate summaries of the sum of the sample size for continuous outcomes. For binary outcomes such as number of patients with an adverse event, the event rates (n/N: number of patients with events divided by sum of number of patients) are shown with percentages. Reporting or publication bias was only taken into consideration in the quality assessment and included in the Clinical Study Characteristics table if it was apparent.

Each outcome was examined separately for the quality elements listed and defined in Table 1 in the full version of the original guideline document

and each graded using the quality levels listed in Table 2 in the full version of the original guideline document. The main criteria considered in the rating of these elements are discussed below. Footnotes were used to describe reasons for grading a quality element as having serious or very serious problems. The ratings for each component were summed to obtain an overall assessment for each outcome.

Grading the Quality of Clinical Evidence

After results were pooled, the overall quality of evidence for each outcome was considered. The following procedure was adopted when using GRADE:

1. A quality rating was assigned, based on the study design. Randomised controlled trials start HIGH and observational studies as LOW, uncontrolled case series as LOW or VERY LOW.
2. The rating was then downgraded for the specified criteria: study limitations, inconsistency, indirectness, imprecision, and reporting bias. These criteria are detailed in section 4.3 of the full version of the original guideline document. Observational studies were upgraded if there was a large magnitude of effect, doseâ€response gradient, and if all plausible confounding would reduce a demonstrated effect or suggest a spurious effect when results showed no effect. Each quality element considered to have 'serious' or 'very serious' risk of bias was rated down 1 or 2 points respectively.
3. The downgraded/upgraded marks were then summed and the overall quality rating was revised. For example, all randomised controlled trials started as HIGH and the overall quality became MODERATE, LOW, or VERY LOW if 1, 2 or 3 points were deducted respectively.
4. The reasons or criteria used for downgrading were specified in the footnotes.

The details of criteria used for each of the main quality element are discussed further in Sections 4.3.7 to 4.3.10 of the full version of the original guideline document.

Evidence of Costâ€effectiveness

Evidence on cost-effectiveness related to the key clinical issues being addressed in the guideline was sought. The health economist undertook:

- A systematic review of the published economic literature
- New cost-effectiveness analysis in priority areas

Literature Review

The health economist:

- Extracted key information about the study's methods and results into evidence tables (evidence tables are included in Appendix H of the full version of the original guideline document)
- Generated summaries of the evidence in NICE economic evidence profiles (included in the relevant chapter writeâ€ups in the full version of the original guideline document)

When no relevant published studies were found, and a new analysis was not prioritised, the GDG made a qualitative judgement about cost-effectiveness by considering expected differences in resource use between comparators and relevant UK National Health Service (NHS) unit costs alongside the results of the clinical review of effectiveness evidence. Where considered useful, this included calculation of expected cost differences and consideration of the quality-adjusted life year (QALY) gain that would be required to justify the expected additional cost of the intervention being considered. Unit costs were based on published national source where available. Staff costs are reported using the typical salary band of someone delivering the intervention as identified by clinical GDG members. It should be noted however that in practice staff bands will vary due to the need for a skill mix across teams. Inputs to calculations should not be interpreted as recommendations about who should deliver care.

NICE Economic Evidence Profiles

The NICE economic evidence profile has been used to summarise cost and costâ€effectiveness estimates. The economic evidence profile shows, for each economic study, an assessment of applicability and methodological quality, with footnotes indicating the reasons for the assessment. These assessments were made by the health economist using the economic evaluation checklist from the Guidelines Manual, Appendix H (see the "Availability of Companion Documents" field). It also shows incremental costs, incremental effects (for example, quality-adjusted life-years [QALYs]) and the incremental costâ€effectiveness ratio from the primary analysis, as well as information about the assessment of uncertainty in the analysis. See Table 6 in the full version of the original guideline for more details.

If a non-UK study was included in the profile, the results were converted into pounds sterling using the appropriate purchasing power parity.

Post Consultation Protocol Including Modified Delphi Methodology

The full report was circulated to the GDG. The consensus statements emerging from the iterative modified Delphi technique were presented to the GDG and formed the basis of discussion. Then the economic search results were rechecked to see if there were any economic analyses relating to areas where new recommendations had been made during the modified Delphi process. Since no economic evaluations were found on the new areas of the guideline, the GDG made a qualitative judgement about the cost-effectiveness of the interventions they wanted to recommend based on the Delphi statements. Economic considerations were drafted for all those new recommendations where economic implications were deemed important.

Methods Used to Formulate the Recommendations

Expert Consensus

Expert Consensus (Delphi)

Description of Methods Used to Formulate the Recommendations

Note from the National Guideline Clearinghouse (NGC): This guideline was developed by the National Clinical Guideline Centre (NCGC) on behalf of the National Institute for Health and Care Excellence (NICE). See the "Availability of Companion Documents" field for the full version of this guidance.

This guidance was developed in accordance with the methods outlined in the NICE Guidelines Manual 2009 (see the "Availability of Companion Documents" field).

A multidisciplinary Guideline Development Group (GDG) comprising professional group members and consumer representatives of the main stakeholders developed this guideline. The group met approximately every 5 weeks during the development of the guideline.

Developing Recommendations

Over the course of the guideline development process, the GDG was presented with:

- Evidence tables of the clinical and economic evidence reviewed from the literature. All evidence tables are in Appendices H and I of the full version of the original guideline document
- Summary of clinical and economic evidence and quality (as presented in chapters 7 through 17 of the full version of the original guideline document)
- Forest plots (Appendix J in the full version of the original guideline document)
- A description of the methods and results of the cost-effectiveness analysis undertaken for the guideline (Appendix K in the full version of the original guideline document)

Recommendations were drafted on the basis of the GDG interpretation of the available evidence, taking into account the balance of benefits, harms, and costs. When clinical and economic evidence was of poor quality, conflicting, or absent, the GDG drafted recommendations based on their expert opinion. The considerations for making informal consensus based recommendations include the balance between potential harms and benefits, economic or implications compared to the benefits, current practices, recommendations made in other relevant guidelines, patient preferences, and equality issues. The informal consensus recommendations were done through discussions in the GDG. The GDG may also consider whether the uncertainty is sufficient to justify delaying making a recommendation to await further research, taking into account the potential harm of failing to make a clear recommendation (see Appendix L in the full version of the original guideline document).

The main considerations specific to each recommendation are outlined in the "Recommendations and Links to Evidence" sections within each chapter of the full version of the original guideline document.

Post Consultation Protocol Including Modified Delphi Methodology

During consultation, substantial stakeholder comments were received which highlighted a number of significant issues in relation to the guideline scope and recommendations developed in the guideline. Stakeholders raised concerns that the guideline was incomplete because of the number of areas in the rehabilitation patient care pathway that the guideline had not covered, and this may result in therapies and services for the stroke population being reduced or even withdrawn. The areas identified in the consultation period included:

- Service delivery, roles, and responsibility of the multidisciplinary team/stroke rehabilitation services

- Holistic assessment, care planning, goal setting, ongoing review, and monitoring
- Transfer of care/discharge planning and interface with social care
- Long-term health and social support for people after stroke and patient information needs

Stakeholders also considered that some topics included in the scope had not been addressed adequately, including mood disorders (depression and anxiety), physical fitness and exercise, other speech and language therapies, and diplopia.

The focus of the outcomes for the interventions included in the guideline has been on function and mobility as these were considered by the GDG to have the biggest impact on patients' lives. However many stakeholders considered that the patient experience and holistic approaches to care had been neglected and represented a major gap in the guidance. In light of the comments received from stakeholders, the GDG agreed that additional work should be carried out for some of these areas or reference made to other NICE guidance, in order to produce a more complete piece of guidance that would be useful to health professionals delivering rehabilitation to a stroke population. The current guidance has followed standard NICE methodology and the GDG were in agreement that for those areas where either weak or no evidence was available a robust process needed to be followed.

In consultation with NICE and the GDG the NCGC technical team conducted additional work to address the areas identified by stakeholders and not covered in the original scope. Reviews of the clinical and economic literature were undertaken following the usual NICE process and presented to the GDG who used this evidence as a basis to make further recommendations.

Where there were recommendations in other NICE guidance relevant to the stroke population and addressed comments highlighted by stakeholders, cross reference to these was made rather than undertaking further original work.

Relevant guidelines identified from the comprehensive search were quality assessed using the Appraisal of Guidelines for Research & Evaluation (AGREE II) tool checklist. Those of sufficient quality were reviewed for recommendations relating to the topics identified in the stakeholder consultation. The full protocol can be found in Appendix B of the full version of the original guideline document.

Modified Delphi Consensus Methodology

As the evidence base was weak or absent for many of the areas stakeholders wished the guideline to include a different methodology. This was seen as necessary since it would provide a robust process to enable the GDG to make further recommendations. Where there was a lack of published evidence the NCGC technical team used a modified Delphi method (anonymous, multi-round, consensus-building technique) based on other available guidelines or expert opinion. This type of survey has been used successfully for generating, analysing, and synthesising expert view to reach a group consensus position. The technique uses sequential questionnaires to solicit individual responses, with the potential threat of peer pressure removed. This is an important consideration and is a key strength of the technique. Strauss and Ziegler's (1975) seminal work on the technique highlights the features of the technique:

- Enables the effective use of a panel of experts
- Data is generated through sequential questioning
- Highlights consensus and divergent opinion
- Anonymity is guaranteed
- It handles judgemental data effectively

In NICE processes, little or no evidence for reviews is an exceptional circumstance when formal consensus techniques (such as the Delphi method) can be adopted. The methods and process proposed was discussed with methodological advisers within NICE and the protocol was agreed and signed off by them prior to work being carried out.

Delphi statements were distilled from the content of existing national and international stroke rehabilitation guidelines. The identified guidelines were quality assured by two research fellows using the AGREE II instrument as described in the Appendix F of the full version of the original guideline document. The relevant sections of the guidelines were summarised (and noted whether the recommendations were based on consensus or evidence) and these summaries were used as the basis for draft statements. Statements were then discussed and revised with two external experts recruited to act as consultants in the development of the survey statements. A table with the relevant guideline sections and first draft statement can be found in Appendix F of the full version of the original guideline document.

The Delphi panel comprised stroke rehabilitation clinicians and other professionals with significant experience in stroke rehabilitation (referred to as the Delphi panel) covering a wide range of disciplines involved in stroke care. Members of the panel were identified by means of nomination by the GDG, and these were then collated and reviewed by the chair of the GDG and the Royal College of Physicians Intercollegiate Stroke Working Party and, after removal of duplicates, inspected for representativeness. In the first instance 164 experts were contacted and invited to participate. The professions comprised geriatricians, neurologists, nurses, occupational therapists, people from patient representation/organisations,

physiotherapists, psychologists, research/policy makers, social workers, speech and language therapists, stroke physicians, and other health care professionals (for example orthoptists, dieticians, general practitioners, and pharmacists).

A survey, consisting of 68 statements plus 3 demographic questions (profession, setting, and geographic area), was then circulated to the Delphi panel. Free text boxes were available for panel comments, these were then evaluated and used to revise and refine statements if necessary. This process was carried out in conjunction with the consultant experts as well as the Chair of the guideline. The results from each round was summarised and then communicated to participants. Four rounds of the survey were undertaken in total. For the majority of statements (plus demographics), a Likert scale was applied to indicate the level of agreement. Some statements employed multiple choice options. A four option Likert scale was used: strongly disagree, disagree, agree, and strongly agree. The purpose of using a four point scale was to be consistent for Delphi panel members who may have been familiar with both the size of scale and terms used to support Delphi processes from previous consensus work in Stroke Care.

The full report was circulated to the GDG. The consensus statements emerging from the iterative modified Delphi technique were presented to the GDG and formed the basis of discussion.

A summary of the areas that are addressed in the post consultation process and the type of evidence identified is provided in Table 7 in the full version of the original guideline document.

The GDG formulated new recommendations based on the consensus statements. The full Delphi report is in Appendix F of the full version of the original guideline document.

Rating Scheme for the Strength of the Recommendations

Strength of Recommendations

Some recommendations can be made with more certainty than others. The Guideline Development Group (GDG) makes a recommendation based on the trade-off between the benefits and harms of an intervention, taking into account the quality of the underpinning evidence. For some interventions, the GDG is confident that, given the information it has looked at, most patients would choose the intervention. The wording used in the recommendations in this guideline denotes the certainty with which the recommendation is made (the strength of the recommendation).

Interventions That Must (or Must Not) Be Used

The GDG usually uses 'must' or 'must not' only if there is a legal duty to apply the recommendation. Occasionally 'must' (or 'must not') is used if the consequences of not following the recommendation could be extremely serious or potentially life threatening.

Interventions That Should (or Should Not) Be Used – a 'Strong' Recommendation

The GDG uses 'offer' (and similar words such as 'refer' or 'advise') when confident that, for the vast majority of patients, an intervention will do more good than harm, and be cost-effective. Similar forms of words (for example, 'Do not offer...') are used when the GDG is confident that an intervention will not be of benefit for most patients.

Interventions That Could Be Used

The GDG uses 'consider' when confident that an intervention will do more good than harm for most patients, and be cost-effective, but other options may be similarly cost-effective. The choice of intervention, and whether or not to have the intervention at all, is more likely to depend on the patient's values and preferences than for a strong recommendation, and so the healthcare professional should spend more time considering and discussing the options with the patient.

Cost Analysis

Undertaking New Health Economic Analysis

As well as reviewing the published economic literature for each review question new economic analysis was undertaken by the health economist in selected areas. Priority areas for new health economic analysis were agreed by the Guideline Development Group (GDG) after formation of the review questions and consideration of the available health economic evidence.

The GDG identified intensity of rehabilitation as the highest priority area for an original economic model. This issue impacts the largest group of people in the guideline as it relates to the whole population rather than a specific subset. In addition, the GDG considered that the intensity of

rehabilitation provided currently varies considerably from service to service in terms of hours per day and duration of therapy, and it is generally lower than that currently recommended in the National Institute for Health and Care Excellence (NICE) quality standard for ongoing rehabilitation. Therefore recommendations in this area were considered likely to have the biggest impact on National Health Service resources and patient outcomes.

The following general principles were adhered to in developing the cost-effectiveness analysis:

- Methods were consistent with the NICE reference case.
- The GDG was consulted during the construction and interpretation of the model.
- Model inputs were based on the systematic review of the clinical literature supplemented with other published data sources where possible.
- When published data was not available expert opinion was used to populate the model.
- Model inputs and assumptions were reported fully and transparently.
- The results were subject to sensitivity analysis and limitations were discussed.
- The model was peer-reviewed by another health economist at the NCGC.

Full methods for the intensity of rehabilitation cost-effectiveness analysis are described in Appendix K in the full version of the original guideline document (see the "Availability of Companion Documents" field).

Cost-effectiveness Criteria

In general, an intervention was considered to be cost-effective if either of the following criteria applied (given that the estimate was considered plausible):

- a. The intervention dominated other relevant strategies (that is, it was both less costly in terms of resource use and more clinically effective compared with all the other relevant alternative strategies), or
- b. The intervention cost less than £20,000 per quality-adjusted life-year (QALY) gained compared with the next best strategy.

If the GDG recommended an intervention that was estimated to cost more than £20,000 per QALY gained, or did not recommend one that was estimated to cost less than £20,000 per QALY gained, the reasons for this decision are discussed explicitly in the 'from evidence to recommendations' section of the relevant chapter with reference to issues regarding the plausibility of the estimate or to the factors set out in the NICE report 'Social value judgements: principles for the development of NICE guidance'.

If a study reported the cost per life year gained but not QALYs, the cost per QALY gained was estimated by multiplying by an appropriate utility estimate to aid interpretation. The estimated cost per QALY gained is reported in the economic evidence profile with a footnote detailing the life-years gained and the utility value used. When QALYs or life years gained are not used in the analysis, results are difficult to interpret unless one strategy dominates the others with respect to every relevant health outcome and cost.

See the individual chapters of the full version of the original guideline document (see the "Availability of Companion Documents" field) for discussions of the cost-effectiveness of specific recommendations.

Cost-Effectiveness Model

A cost-utility analysis was undertaken to evaluate the cost-effectiveness of more intensive versus less intensive stroke rehabilitation. Lifetime QALYs and costs were estimated from a current UK National Health Service and personal social services perspective.

More intensive rehabilitation was found to be cost-effective compared to less intensive rehabilitation, based on a modelled analysis using levels of intervention and outcomes in a published 2006 study (24 versus 18 rehabilitation sessions; EQ5D difference 0.14 at 3 months) and a range of long-term utility assumptions. However, these conclusions are limited by concerns regarding applicability of the published study to current UK practice.

See Appendix K in the full version of the guideline (see the "Availability of Companion Documents" field) for a full discussion of this model.

Method of Guideline Validation

External Peer Review

Internal Peer Review

Description of Method of Guideline Validation

The guidance is subject to an eight week public consultation and feedback as part of the quality assurance and peer review the document. All comments received from registered stakeholders are responded to in turn and posted on the National Institute for Health and Care Excellence (NICE) Web site when the pre-publication check of the full guideline occurs. Based on comments from the stakeholders during this consultation further areas were identified where guidance was needed in order to address the patient pathway more comprehensively. For this reason a 'post consultation' protocol was drawn up and agreed with NICE. A second consultation was then held after this extended development period.

The final draft was submitted to the Guideline Review Panel for review prior to publication.

Evidence Supporting the Recommendations

Type of Evidence Supporting the Recommendations

The type of evidence supporting the recommendations is not specifically stated.

Benefits/Harms of Implementing the Guideline Recommendations

Potential Benefits

Appropriate management of long-term rehabilitation after stroke

See the "Trade-off between clinical benefits and harms" sections of the full version of the original guideline document for additional details about benefits of specific interventions.

Potential Harms

- The Guideline Development Group (GDG) highlighted that early supported discharge could place a burden on the carer and noted the importance of the integration of health and social care to enable an adequate assessment including equipment needs and a care needs assessment undertaken and care plan agreed for the patient and their family.
- The studies on participation in physical activity after stroke did not comment on harm or potential side effects. Adverse events were not consistently reported within these studies but require serious consideration. Shoulder pain is the most likely harm people experience.
- The GDG noted that some health professionals have expressed a concern that strength training may be associated with an increase in tone that in time, may lead to deterioration in function.
- The GDG agreed that information and training for the patient and carers was important for them to ensure the splint was used correctly and to recognise any adverse effects that would need professional care and advice.
- There are few risks associated with electrical stimulation. The commonest is a skin reaction when self-adhesive electrodes are used.
- Only one study reported adverse events, the experience of muscle tenderness in the affected arm during constraint induced movement therapy (CIMT), though its prevalence was not significantly different between the two groups. However the GDG considered there were possible harms associated with this therapy and agreed that when selecting patients for CIMT, attention needs to be made to potential adverse events such as falling and deterioration in mood.
- The GDG agreed ankle foot orthoses should have a biomechanical rationale (to improve function), should be comfortable and well fitted to prevent pain and pressure sores.

Contraindications

Contraindications

Potential contraindications for wrist and hand splints may include sensory impairment, spasticity, poor skin condition including inflammation,

oedema, and poor vascular supply, each of which may contribute to skin break down after stroke.

Qualifying Statements

Qualifying Statements

- This guidance represents the view of National Institute for Health and Care Excellence (NICE), which was arrived at after careful consideration of the evidence available. Healthcare professionals are expected to take it fully into account when exercising their clinical judgement. However, the guidance does not override the individual responsibility of healthcare professionals to make decisions appropriate to the circumstances of the individual patient, in consultation with the patient and/or guardian or carer, and informed by the summaries of product characteristics of any drugs.
- Implementation of this guidance is the responsibility of local commissioners and/or providers. Commissioners and providers are reminded that it is their responsibility to implement the guidance, in their local context, in light of their duties to have due regard to the need to eliminate unlawful discrimination, advance equality of opportunity and foster good relations. Nothing in this guidance should be interpreted in a way that would be inconsistent with compliance with those duties.
- Treatment and care should take into account individual needs and preferences. Patients should have the opportunity to make informed decisions about their care and treatment, in partnership with their healthcare professionals. If the patient is under 16, their family or carers should also be given information and support to help the child or young person to make decisions about their treatment. Healthcare professionals should follow the [Department of Health's advice on consent](#) . If someone does not have capacity to make decisions, healthcare professionals should follow the code of practice that accompanies the Mental Capacity Act and the supplementary code of practice on deprivation of liberty safeguards. In Wales, healthcare professionals should follow advice on consent from the Welsh Government.
- For all recommendations, NICE expects that there is discussion with the patient about the risks and benefits of the interventions, and their values and preferences. This discussion aims to help them to reach a fully informed decision.

Implementation of the Guideline

Description of Implementation Strategy

The National Institute for Health and Care Excellence (NICE) has developed tools to help organisations implement this guidance. These are available on the [NICE Web site](#) (see also the "Availability of Companion Documents" field).

Key Priorities for Implementation

The following recommendations have been identified as priorities for implementation.

Stroke Units

- People with disability after stroke should receive rehabilitation in a dedicated stroke inpatient unit and subsequently from a specialist stroke team within the community.

The Core Multidisciplinary Stroke Team

- A core multidisciplinary stroke rehabilitation team should comprise the following professionals with expertise in stroke rehabilitation:
 - Consultant physicians
 - Nurses
 - Physiotherapists
 - Occupational therapists
 - Speech and language therapists
 - Clinical psychologists
 - Rehabilitation assistants
 - Social workers

Health and Social Care Interface

- Health and social care professionals should work collaboratively to ensure a social care assessment is carried out promptly, where needed, before the person with stroke is transferred from hospital to the community. The assessment should:
 - Identify any ongoing needs of the person and their family or carer, for example, access to benefits, care needs, housing, community participation, return to work, transport, and access to voluntary services
 - Be documented and all needs recorded in the person's health and social care plan, with a copy provided to the person with stroke

Transfer of Care from Hospital to Community

- Offer early supported discharge to people with stroke who are able to transfer from bed to chair independently or with assistance, as long as a safe and secure environment can be provided.

Setting Goals for Rehabilitation

- Ensure that goal-setting meetings during stroke rehabilitation:
 - Are timetabled into the working week
 - Involve the person with stroke and, where appropriate, their family or carer in the discussion

Intensity of Stroke Rehabilitation

- Offer initially at least 45 minutes of each relevant stroke rehabilitation therapy for a minimum of 5 days per week to people who have the ability to participate, and where functional goals can be achieved. If more rehabilitation is needed at a later stage, tailor the intensity to the person's needs at that time. (Intensity of therapy for dysphagia, provided as part of speech and language therapy, is addressed under "Swallowing," below.)

Cognitive Functioning

- Screen people after stroke for cognitive deficits. Where a cognitive deficit is identified, carry out a detailed assessment using valid, reliable, and responsive tools before designing a treatment programme.

Emotional Functioning

- Assess emotional functioning in the context of cognitive difficulties in people after stroke. Any intervention chosen should take into consideration the type or complexity of the person's neuropsychological presentation and relevant personal history.

Swallowing

- Offer swallowing therapy at least 3 times a week to people with dysphagia after stroke who are able to participate, for as long as they continue to make functional gains. Swallowing therapy could include compensatory strategies, exercises, and postural advice.

Return to Work

- Return-to-work issues should be identified as soon as possible after the person's stroke, reviewed regularly and managed actively. Active management should include:
 - Identifying the physical, cognitive, communication, and psychological demands of the job (for example, multi-tasking by answering emails and telephone calls in a busy office)
 - Identifying any impairments on work performance (for example, physical limitations, anxiety, fatigue preventing attendance for a full day at work, cognitive impairments preventing multi-tasking, and communication deficits)
 - Tailoring an intervention (for example, teaching strategies to support multi-tasking or memory difficulties, teaching the use of voice-activated software for people with difficulty typing, and delivery of work simulations)
 - Educating about the Equality Act 2010 and support available (for example, an access to work scheme)
 - Workplace visits and liaison with employers to establish reasonable accommodations, such as provision of equipment and graded return to work

Long-term Health and Social Support

- Review the health and social care needs of people after stroke and the needs of their carers at 6 months and annually thereafter. These reviews should cover participation and community roles to ensure that people's goals are addressed.

Implementation Tools

Clinical Algorithm

Foreign Language Translations

Mobile Device Resources

Patient Resources

Resources

For information about availability, see the *Availability of Companion Documents* and *Patient Resources* fields below.

Institute of Medicine (IOM) National Healthcare Quality Report Categories

IOM Care Need

Living with Illness

Staying Healthy

IOM Domain

Effectiveness

Patient-centeredness

Identifying Information and Availability

Bibliographic Source(s)

National Clinical Guideline Centre. Stroke rehabilitation. Long-term rehabilitation after stroke. London (UK): National Institute for Health and Care Excellence (NICE); 2013 Jun. 45 p. (Clinical guideline; no. 162).

Adaptation

Not applicable: The guideline was not adapted from another source.

Date Released

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Guideline Developer(s)

National Clinical Guideline Centre - National Government Agency [Non-U.S.]

Source(s) of Funding

National Institute for Health and Care Excellence (NICE)

Guideline Committee

Guideline Development Group (GDG)

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Financial Disclosures/Conflicts of Interest

At the start of the guideline development process all guideline development group members declared interests including consultancies, fee-paid work, shareholdings, fellowships, and support from the healthcare industry. At all subsequent guideline development group meetings, members declared arising conflicts of interest, which were also recorded (see Appendix C in the full version of the original guideline document [see the "Availability of Companion Documents" field]).

Members were either required to withdraw completely or for part of the discussion if their declared interest made it appropriate. The details of declared interests and the actions taken are shown in Appendix C in the full version of the original guideline document.

Guideline Status

This is the current release of the guideline.

Guideline Availability

Electronic copies: Available from the [National Institute for Health and Care Excellence \(NICE\) Web site](#) . Also available for download as a Kindle or EPUB ebook from the [NICE Web site](#) .

Availability of Companion Documents

The following are available:

- Stroke rehabilitation. Long-term rehabilitation after stroke. Full guideline. London (UK): National Institute for Health and Care Excellence (NICE); 2013 Jun. 591 p. (Clinical guideline; no 162). Electronic copies: Available in Portable Document Format (PDF) from the [National Institute for Health and Care Excellence \(NICE\) Web site](#) .

- Stroke rehabilitation. Long-term rehabilitation after stroke. Appendices. London (UK): National Institute for Health and Care Excellence (NICE); 2013 Jun. 824 p. (Clinical guideline; no 162). Electronic copies: Available in PDF from the [NICE Web site](#) .
- Stroke rehabilitation. Long-term rehabilitation after stroke. Baseline assessment tool. London (UK): National Institute for Health and Care Excellence (NICE); 2013 Jun. (Clinical guideline; no 162). Electronic copies: Available from the [NICE Web site](#) .
- Stroke rehabilitation. Long-term rehabilitation after stroke. Costing report. London (UK): National Institute for Health and Care Excellence (NICE); 2013 Jun. 29 p. (Clinical guideline; no 162). Electronic copies: Available in PDF from the [NICE Web site](#) .
- Stroke rehabilitation. Long-term rehabilitation after stroke. Costing template. London (UK): National Institute for Health and Care Excellence (NICE); 2013 Jun. (Clinical guideline; no 162). Electronic copies: Available from the [NICE Web site](#) .
- Stroke overview. NICE pathway. London (UK): National Institute for Health and Care Excellence (NICE). Electronic copies: Available from the [NICE Web site](#) .
- Stroke rehabilitation: support for education and learning - implementation advice. London (UK): National Institute for Health and Care Excellence (NICE); 2013 Jun. Electronic copies: Available from the [NICE Web site](#) .
- The guidelines manual 2009. London (UK): National Institute for Health and Care Excellence (NICE); 2009 Jan. Electronic copies: Available in PDF from the [NICE Web site](#) .

Patient Resources

The following is available:

- Rehabilitation after stroke. Information for the public. London (UK): National Institute for Health and Care Excellence (NICE); 2013 Jun. Electronic copies: Available from the [National Institute for Health and Care Excellence \(NICE\) Web site](#) . Also available for download as a Kindle or EPUB ebook from the [NICE Web site](#) . Also available in Welsh from the [NICE Web site](#) .

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